



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,419	06/20/2003	Hongxin Song	MP0275	6709
26200 7590 11/08/2007 FISH & RICHARDSON P.C. P.O BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER RIZK, SAMIR WADIE	
			ART UNIT 2112	PAPER NUMBER
			MAIL DATE 11/08/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/600,419	SONG ET AL.	
	Examiner	Art Unit	
	Sam Rizk	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-16, 18-26, 29-41, 43-48, 51-58, 60-68 and 71-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-16, 18-26, 29-41, 43-48, 51-58, 60-68 and 71-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Response to the applicant's RCE dated 9/20/2007

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/20/2007 has been entered.

- Claims 7, 17, 27, 28, 42, 49, 50, 59, 69 and 70 have been cancelled
- Amended claims 1-6, 8-16, 18-26, 29-41, 43-48, 51-58, 60-68 and 71-78 have been submitted for examination
- Amended claims 1-6, 8-16, 18-26, 29-41, 43-48, 51-58, 60-68 and 71-78 have been rejected

Response to Arguments

1. Applicant's arguments, see pages 23-31 filed on 9/20/2007 have been fully considered but they are not persuasive.
2. The Examiner relied on Rothberg for the rejections of the independent claims 1, 9, 12, 19, 22, 30, 34, 43, 45, 52, 53, 61, 64 and 72. Rothberg teaches an error correction circuit responsive to the detector and the averaging circuit to provide a signal quality metric that governs which signals are averaged (Note: FIG. 4 and col. 4, lines (27-58) in Rothberg).

Art Unit: 2112

3. The Examiner disagrees with the applicant and maintains the rejection of claims 1-6, 8-16, 18-26, 29-41, 43-48, 51-58, 60-68 and 71-78. All the amendments and arguments have been considered. It is the Examiner's conclusion that claims 1-6, 8-16, 18-26, 29-41, 43-48, 51-58, 60-68 and 71-78 is not patentably distinct or non-obvious over the prior art of record in view of the reference(s), Rothberg and in further view of Takashi.
4. The Examiner relied upon the same references i.e. Rothberg US patent no. 7,136,244 and in further view of Takashi et al. US 6519715 for the rejections of the amended claims as in the final office action mailed on 6/20/2007 as follows:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 9-12, 19-24, 26, 30-35, 43-46, 52-54, 68 and 72-78 are rejected under 35 U.S.C. 102(e) as being anticipated by Rothberg US patent no. 7,136,244 (Hereinafter Rothberg).
6. In regard to claim 1, Rothberg teaches:
 - (currently amended) A signal processing apparatus comprising:
 - an input to receive a signal;

Art Unit: 2112

(Note: FIG. 1B reference character (14) in Rothberg)

- a buffer responsive to the input to store the signal;

(Note: FIG. 1B reference character (16) in Rothberg)

- a detector responsive to the input to interpret the signal as discrete values;

(Note: FIG. 2, reference character (24) in Rothberg)

- an averaging circuit responsive to the buffer and the detector to cause interpretation, by the detector during a retry mode, of a new signal comprising an average of a previous signal stored in the buffer and a current signal; and

(Note: FIG. 1B reference character (20) in Rothberg)

- a control circuit that determines whether the discrete values are adequately indicated based on output of the detector, that initiates the retry mode when the discrete values are not adequately indicated, and that determines whether the discrete values are adequately indicated from the interpretation of the new signal in the retry mode, and

(Note: FIG. 1 B, reference character (18) and FIG. 8, reference characters (68) and (72) and col. 8, lines (55-65) in Rothberg)

- an error correction circuit responsive to the detector and the averaging circuit to provide a signal quality metric that governs which signals are averaged.

(Note: FIG. 4 and col. 4, lines (27-58) in Rothberg)

Art Unit: 2112

7. In regard to claim 2, Rothberg teaches:

- (previously presented) The apparatus of claim 1, wherein the signal from the input comprises a read signal received from a storage medium.

(Note: FIG. 1 B, reference character (10) in Rothberg)

8. Claims 9, 12, 19, 22, 30, 34, 43, 45, 52, 53, 61, 64 and 72 are rejected for the same reasons as per claim 1.

9. In regard to claim 10, Rothberg teaches:

- (currently amended) The apparatus of claim 1, a wherein the control circuit causes averaging of a defined number of most recent input signals, wherein the defined number is greater than two.

(Note: FIG. 2, reference characters (32o - 32n) in Rothberg)

10. In regard to claim 11, Rothberg teaches:

- (currently amended) The apparatus of claim 1, wherein the control circuit causes the previous signal stored in the buffer to be an averaged input signal when two or more signals are obtained in the retry mode.

(Note: FIG. 2, reference characters (32o - 32n) in Rothberg)

11. Claims 20, 31, 62, 73, 76, 75 and 78 are rejected for the same reasons as per claim 10.

12. Claims 21, 24, 32, 33, 44, 63, 66, 74 and 77 are rejected for the same reasons as per claim 11.

Art Unit: 2112

13. In regard to claim 22, Rothberg teaches;

- (currently amended) A method of reading data on a channel or media, the method comprising;
- interpreting an input signal as discrete values; and
- deciding whether the discrete values have been adequately interpreted from the input entering a retry mode in response to a decision that the discrete values have not been adequately interpreted from the input signal; and an inadequate signal;
- averaging, in the retry mode, multiple signals to improve interpretation of the input signal including:
- obtaining a second signal representing same data as the input signal, averaging the input signal and the second signal to produce an averaged signal and to improve signal interpretation;
- interpreting the averaged signal, and
- determining whether the discrete values are adequately indicated based on the averaged signal

(Note: Claim 11 in Rothberg)

14. Claims 23, 35, 46, 54 and 65 are rejected for the same reasons as per claim 2.

15. In regard to claim 26, Rothberg teaches:

- (original) The method of claim 22, wherein the input signal comprises a read signal received from a storage medium, interpreting the input signal comprises determining if the read signal adequately indicates

Art Unit: 2112

the discrete values, and averaging the multiple signals comprises averaging multiple read signals of the storage medium to improve read signal interpretation.

(Note: FIG. 3 and col. 4, lines (13-26) in Rothberg)

16. Claims 34 and 45, 64 are rejected for the same reasons as per claim 22.
17. Claims 43, 52, 61, 68 and 72 are rejected for the same reasons as per claim 26.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 2112

18. Claims 3-6, 8, 13-16, 18, 25, 29, 36-41, 47, 48, 51, 55-58, 60, 67 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rothberg as applied to claim 1 above, and further in view of Takashi et al. US patent no. 6519715 (Hereinafter Takashi)

19. In regard to claim 3, Rothberg teaches substantially all the limitations in claim 1. However, Rothberg does not teach:

- (previously presented) The apparatus of claim 1, wherein the signal from the input comprises an analog signal, the apparatus further comprising a filter and an analog-to-digital Converter (ADC) coupled between the input and the detector.

Takashi, in an analogous art that teaches improved reliability of the data recovery processing and data recording from storage medium teaches:

- (previously presented) The apparatus of claim 1, wherein the signal from the input comprises an analog signal, the apparatus further comprising a filter and an analog-to-digital converter (ADC) coupled between the input and the detector.

(Note; Figure 1, reference characters (1), (3) and (4) in Takashi)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Takashi that comprises a filter and an analog-to-digital converter (ADC) coupled between the input and the detector with the teaching of Rothberg.

Art Unit: 2112

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need for improved reliability of the data recovery processing and data recording from storage medium teaches.

- In regard to claim 4, Takashi teaches:

(original) The apparatus of claim 3, wherein the buffer is coupled between the ADC and the filter.

(Note: FIG. 2, reference character (6) in Takashi)

20. In regard to claim 5, Takashi teaches:

- (original) The apparatus of claim 3, wherein the buffer is coupled between the filter and the detector.

(Note: FIG. 2, reference character (6) in Takashi)

21. In regard to claim 6, Takashi teaches:

- (original) The apparatus of claim 3, wherein the filter comprises a finite impulse response (FIR) digital filter coupled between the ADC and the detector.

(Note: col. 8, line 42 in Takashi)

22. In regard to claim 8, Takashi teaches:

- (original) The apparatus of claim 1, wherein the detector comprises a Viterbi detector.

(Note: FIG. 35, reference character (13) in Takashi)

Art Unit: 2112

23. Claim 13, 38, 47 and 55 are rejected for the same reasons as per claim 3.
24. Claims 14, 36, 39 and 56 are rejected for the same reasons as per claim 4.
25. Claims 15, 40 and 57 are rejected for the same reasons as per claim 5.
26. Claims 16, 25, 48, 58 and 67 are rejected for the same reasons as per claim 6.
27. Claims 18, 27, 29, 41, 49, 51, 60, 69 and 71 are rejected for the same reasons as per claim 8.
28. Claim 37 is rejected for the same reasons as per claim 11.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Rizk whose telephone number is (571) 272-8191. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 2112

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronics Business Center (EBC) at 866-217-9197 (toll-free)

Sam Rizk,

Examiner

ART UNIT 2112

Sam Rizk
11/2/07

Jacques Louis-Jacques
JACQUES LOUIS-JACQUES
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100